CLAIMS

What is claimed is:

1. A control method comprising:

traversing a die-strip through a plurality of substations of an in-line, back-end, integrated circuit (IC) device assembly line;

automatically examining said die-strip at multiple locations within said plurality of substations using a plurality of automated vision camera systems;

collecting information regarding said examining from said plurality of automated vision camera systems and storing said information in a memory resident database of a central computer system; and

controlling processes of said plurality of substations using a common communication protocol and commands and data issued from said central computer system.

2. A method as described in Claim 1 wherein said central computer system is a manufacturing execution system (MES).

3. A method as described in Claim 1 wherein said common communication protocol is a version of the standard semi equipment communications standard/generic equipment model (SECS/GEM).

4. A method as described in Claim 2 wherein said common communication protocol is a version of the standard semi equipment communications standard/generic equipment model (SECS/GEM).

5. A method as described in Claim 1 wherein said collecting information comprises:

communicating said information from said plurality of automated vision systems to an equipment cell controller; and

communicating said information from said equipment cell controller to said central computer system.

6. A method as described in Claim 5 wherein said controlling comprises:

communicating said commands and data from said central computer system to said equipment cell controller; and

communicating said commands and data from said equipment cell controller to said plurality of substations.

7. A method as described in Claim 1 wherein said plurality of substations comprise a front-of-line portion and an end-of-line portion and wherein said collecting information comprises:

communicating information from a first portion of said plurality of automated vision systems of said front-of-line portion to a first equipment cell controller;

communicating information from a second portion of said plurality of automated vision systems of said end-of-line portion to a second equipment cell controller; and

communicating said information from said first and second equipment cell controllers to said central computer system.

8. A method as described in Claim 7 wherein said controlling comprises:

communicating first commands and data from said central computer system to said first equipment cell controller;

communicating said first commands and data from said first equipment cell controller to said front-of-line portion of said plurality of substations;

communicating second commands and data from said central computer system to said second equipment cell controller; and

communicating said second commands and data from said second equipment cell controller to said end-of-line portion of said plurality of substations.

9. A method as described in Claim 1 wherein said collecting information further comprises determining a location of said die-strip by one of said automated vision camera systems identifying a unique code associated with said die-strip.

10. A method as described in Claim 1 wherein said traversing is controlled by said central computer system.

11. A computer control system for a back-end assembly line for IC assembly comprising:

a plurality of substations for processing a die-strip in an in-line fashion;

a plurality of vision camera systems disposed at locations within said plurality of substations for automatically examining said die-strip;

a central computer system coupled to said plurality of vision camera systems and coupled to said plurality of substations, said central computer system for collecting and maintaining information from said vision camera systems in a memory resident database and for communicating with said plurality of substations using a common communication protocol.

12. A system as described in Claim 11 wherein said central computer system is a manufacturing execution system (MES).

13. A system as described in Claim 11 wherein said common communication protocol is a version of the standard semi equipment communications standard/generic equipment model (SECS/GEM).

14. A system as described in Claim 12 wherein said common communication protocol is a version of the standard semi equipment communications standard/generic equipment model (SECS/GEM).

15. A system as described in Claim 11 further comprising an equipment cell controller coupled between said plurality of vision camera systems and said central computer system and for transferring information therebetween.

16. A system as described in Claim 15 wherein said equipment cell controller is also coupled between said central computer system and said plurality of substations for providing communication therebetween.

17. A system as described in Claim 11 wherein said plurality of substations comprise a front-of-line portion and an end-of-line portion and further comprising:

a first equipment cell controller coupled between said central computer system and a first portion of said plurality of automated vision systems of said front-of-line portion and for providing communication therebetween; and

a second equipment cell controller coupled between said central computer system and a second portion of said plurality of automated vision systems of said end-of-line portion and for providing communication therebetween.

18. A system as described in Claim 17 wherein:

said central computer system is also for communicating first commands and data to said first equipment cell controller to control said front-of-line portion of said plurality of substations; and

said central computer system is also for communicating second commands and data to said second equipment cell controller for controlling said end-of-line portion of said plurality of substations.

19. A system as described in Claim 11 wherein said central computer system is also for determining a location of said die-strip by one of said automated vision camera systems reporting an identification of a unique code associated with said die-strip.

20. A system as described in Claim 11 wherein said central computer system is also for controlling traversal and processing of said die-strip through said plurality of substations in an in-line fashion.

21. A system as described in Claim 11 wherein said plurality of substations comprise:

a front-of-line portion;

an end-of-line portion integrated with said front-of-line portion;

a test portion integrated with said end-of-line portion; and

a finish portion integrated with said test portion.

22. A system as described in Claim 21 wherein said front-of-line portion comprises: a die-attach substation; a cure substation; a first plasma substation; a bond substation and a second plasma substation.

23. A system as described in Claim 21 wherein said end-of-line portion comprises: a mold substation; a post mold cure substation; a solder ball attach substation; a saw substation; and a sort substation.

24. A system as described in Claim 21 wherein said finish portion comprises: a marking substation; a final visual inspection substation; and a tape and reel substation.

25. The system of Claim 11 wherein said database controls die-strip traversal and processing details occurring over said plurality of substations.

26. The system Claim 13 wherein said SECS/GEM communication protocol is established in a hierarchical format.

27. A computer control system for a back-end IC device assembly line comprising:

a plurality of substations for processing a die-strip in an in-line fashion;

a plurality of vision camera systems disposed at locations within said plurality of substations for automatically examining said die-strip;

a manufacturing execution system (MES) coupled to said plurality of vision camera systems and coupled to said plurality of substations, said MES for collecting and maintaining information from said vision camera systems in a memory resident database and for controlling said processing said plurality of substations using commands and data communicated using a common communication protocol being version of the standard semi equipment communications standard/generic equipment model (SECS/GEM).

28. A system as described in Claim 27 wherein said plurality of substations comprise a front-of-line portion and an end-of-line portion and further comprising:

a first equipment cell controller coupled between said MES and a first portion of said plurality of automated vision systems of said front-of-line portion and for providing communication therebetween; and

a second equipment cell controller coupled between said MES and a second portion of said plurality of automated vision systems of said end-of-line portion and for providing communication therebetween.

29. A system as described in Claim 28 wherein:

said MES is also for communicating first commands and data to said first equipment cell controller to control said front-of-line portion of said plurality of substations; and

said MES is also for communicating second commands and data to said second equipment cell controller for controlling said end-of-line portion of said plurality of substations.

30. A system as described in Claim 27 wherein said MES is also for determining a location of said die-strip by one of said automated vision camera systems reporting an identification of a unique code associated with said die-strip.

31. A system as described in Claim 27 wherein said MES is also for controlling traversal of said die-strip through said plurality of substations in an in-line fashion.

32. A system as described in Claim 27 wherein said plurality of substations comprise:

a front-of-line portion;

an end-of-line portion integrated with said front-of-line portion;

a test portion integrated with said end-of-line portion; and

a finish portion integrated with said test portion.

33. A system as described in Claim 32 wherein said front-of-line portion comprises: a die-attach substation; a cure substation; a first plasma substation; a bond substation and a second plasma substation.

34. A system as described in Claim 32 wherein said end-of-line portion comprises: a mold substation; a post mold cure substation; a solder ball attach substation; a saw substation; and a sort substation.

35. A system as described in Claim 32 wherein said finish portion comprises: a marking substation; a final visual inspection substation; and a tape and reel substation.

36. The system of Claim 27 wherein said database controls die-strip traversal and processing details occurring over said plurality of substations.

37. The system Claim 27 wherein said SECS/GEM communication protocol is established in a hierarchical format.